

# **ADJUSTABLE AIR RESISTANCE FORCE GENERATING DEVICE FOR EXERCISERS**

## **FIELD OF THE INVENTION**

The present invention relates to an adjustable air resistance force  
5 generating device for exercisers and includes retractable blades so as to adjust the air  
resistance force caused by rotating the blades about a shaft.

## **BACKGROUND OF THE INVENTION**

An air resistance force generating device for exercisers generally includes  
a frame with a plurality of blades connected to a shaft located at a center of the  
10 frame and the shaft is rotated by the users who pull two handles connected to two  
cables which operationally connected to the shaft. When the shaft is rotated, the  
blades rotate with the shaft and hit the air to generate resistance force to the users.  
The user has to apply a force that overcomes the resistance force of the device to  
exercise his or her muscles. Nevertheless, the size and length of the blades are fixed  
15 and cannot be adjusted so that the resistance force could not meet various  
requirements of different users.

The present invention intends to provide an air resistance force generating  
device that has a shaft rotatably received in a casing and a plurality of hollow frames  
connected to the casing, each frame includes a blade that is retractably received in  
20 the frame so that the user can change the length of the blades to generate different  
resistance force.

## **SUMMARY OF THE INVENTION**

The present invention relates to an air resistance force generating device for exercisers and comprises a tubular casing having a shaft rotatably received therein and an adjusting member is connected to an end of the casing. The shaft has  
5 an end fixed to the adjusting member. A plurality of frames extend radially outward from the casing and each of which is a closed frame so as to enclose a through space. A plurality of blades each have one end thereof reeving through the shaft and the other end of the blades are slidably received in the frames.

The present invention will become more obvious from the following  
10 description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a cross sectional view to show the device of the present invention;

15 Fig. 2 is an end cross sectional view to show the block is engaged with the inner periphery of the casing;

Fig. 3 shows two bars transversely extend through the casing and limit the shaft from moving longitudinally;

Fig. 4 shows the adjusting member is engaged with the polygonal end of  
20 the shaft;

Fig. 5 shows an end view of the device of the present invention;

Fig. 6 shows the blades are retracted in the frames by rotating the adjusting member, and

Fig. 7 shows a spring is connected between the frame and the blade.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to Figs. 1 and 5, the air resistance force generating device for exercisers of the present invention comprises a tubular casing 10 which is driven by a belt which is not shown at the left end thereof and a shaft 20 is rotatably received in the casing 10. Referring to Fig. 2, the casing 10 has two grooves 12 defined in an inner periphery thereof and a block 30 is movably mounted to the shaft 20 by engaging two ridges 31 on the block 30 with the grooves 12. The shaft 20 includes a section of outer threaded periphery 22 and the block 30 has a hole with an inner threaded periphery 32 which is threaded engaged with the outer threaded periphery 22, such that when the shaft 20 is rotated, the block 30 is movably on the shaft 20 at the outer threaded periphery 22. Referring to Fig. 3, two bars 40 transversely extend through the casing 10 and the shaft 20 has two notches 24 defined transversely in an outer periphery thereof, the two bars 40 are engaged with the two notches 24 so as to limit the shaft 20 from moving longitudinally.

Further referring to Fig. 4, an adjusting member 50 includes an insertion 51 which is inserted in an open end of the casing 10 and the shaft 20 includes a polygonal shaped end 23 and the adjusting member 50 has a recess 53 with which the polygonal shaped end 23 is securely engaged. The adjusting member 50 has a passage 52 defined therethrough which is in communicating with the recess 53. A bolt 60 extends through the passage 52 and is threaded connected to a threaded hole 231 defined in polygonal shaped end 23 of the shaft 20. By the connection, the shaft 20 can be rotated by rotating the adjusting member 50.

A plurality of frames 11 are connected to the casing 10 and extend radially outward from the casing 10. Each frame 11 is a closed frame so as to enclose a through space. Each frame 11 has an engaging groove 111 defined in an inner periphery thereof and a blade 21 is slidably engaged with the engaging groove 111.

5 The blades 21 each have one end thereof reeving through the shaft 20 such that when the user rotates the adjusting member 50 the other end of the each blade 21 can be slidably moved in the frames 11 so as to adjust the area of the through space not covered by the blade 21 as shown in Fig. 6. The blades 21 are made by flexible material such as steel plates for the convenience of wrapped on the shaft 20. When

10 the user drives the casing 10 to let the frames 11 to rotate, air resistance force is generated according the speed of the rotation of the whole device. If a less resistance force is expected, the adjusting member 50 is rotated to shorten the length of the blades 21.

As shown in Fig. 7, in order to assist the blades 21 to extend from a lower

15 position to a higher position, a spring 70 is connected to each frame 11 and one end of the spring 70 is fixed to the frame 11 and the other end of the spring 70 is connected to the blade 21. Therefore, the blade 21 is pulled by the spring 70 when expanding.

While we have shown and described the embodiment in accordance with

20 the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.